

Boosting Profits and Enhancement of Environment through Adsorption of Methane during Upstream Processes

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Abstract : Natural gas as a fuel has created wonders, but on the contrary, the ill-effects of methane have been a great worry for professionals. The largest source of methane emission is the oil and gas industry among all industries. Methane depletes groundwater and being a greenhouse gas has devastating effects on the atmosphere too. Methane remains for a decade or two in the atmosphere and later breaks into carbon dioxide and thus damages it immensely, as it warms up the atmosphere 72 times more than carbon dioxide in those two decades and keeps on harming after breaking into carbon dioxide afterward. The property of a fluid to adhere to the surface of a solid, better known as adsorption, can be a great boon to minimize the hindrance caused by methane. Adsorption of methane during upstream processes can save the groundwater and atmospheric depletion around the site which can be hugely lucrative to earn profits which are reduced due to environmental degradation leading to project cancellation. The paper would deal with reasons why casing and cementing are not able to prevent leakage and would suggest methods to adsorb methane during upstream processes with mathematical explanation using volumetric analysis of adsorption of methane on the surface of activated carbon doped with copper oxides (which increases the absorption by 54%). The paper would explain in detail (through a cost estimation) how the proposed idea can be hugely beneficial not only to environment but also to the profits earned.

Keywords : adsorption, casing, cementing, cost estimation, volumetric analysis

Conference Title : ICOGPE 2018 : International Conference on Oil, Gas and Petrochemical Engineering

Conference Location : London, United Kingdom

Conference Dates : April 24-25, 2018